

UNITED STATES DISTRICT COURT
DISTRICT OF VERMONT

JAMES D. SULLIVAN, *et al.*,
individually, and on behalf of a Class of
persons similarly situated,
Plaintiffs,

v.

SAINT-GOBAIN PERFORMANCE
PLASTICS CORPORATION,
Defendant.

Civil Action No. 5:16-cv-00125-GWC

SECOND DECLARATION OF DONALD I. SIEGEL, PH.D.

I, Donald I. Siegel, being competent to provide this Declaration, do declare as follows:

1. I am an expert in the field of hydrogeology and have been retained by the Plaintiffs in this case to analyze and provide opinions regarding Perfluorooctanoic Acid (PFOA) contamination of groundwater in North Bennington and Bennington, Vermont.

2. I am senior hydrogeologist at Independent Environmental Scientists, Inc., of Manlius, New York, and serve as Professor of Earth Sciences at Syracuse University. I earned a BS in Geology from the University of Rhode Island, an MS in Geology from Pennsylvania State University, and a PhD in Hydrogeology from the University of Minnesota. My qualifications were described in further detail in my first Declaration and in my C.V. attached to that Declaration. One update is that I have been elected as President Elect of the Geological Society of America (GSA), an international professional geological organization with over 25,000 professional members.

3. I prepared an expert report on the issue of class certification, which was submitted with the Sullivan Plaintiffs' Motion for Class Certification in this case on October 2, 2017.

Since that time, Defendant has taken my deposition, and Defendant's expert witnesses have



provided their reports, two of which addressed my opinions and the bases for them (Daniel J. Morrissey and Lyle R. Chinkin). I have reviewed these reports and have provided a rebuttal report.

4. My rebuttal report, which is incorporated into this Declaration, has been submitted to the Court. The opinions expressed in the rebuttal report are opinions I intend to express in the trial of this case and in any hearing challenging my opinions. I hold the opinions expressed in the rebuttal report to a reasonable degree of scientific certainty.

5. I have continued to review numerous documents from the Vermont Department of Environmental Conservation (VT DEC) and others, including the results of further sampling for PFOA in wells in North Bennington and Bennington, reports on soil samples, and reports of modeling of PFOA contamination in groundwater. I have also continued to evaluate the hydrogeology of the area, including geological maps and surveys, well log data, topographical features, information on surface water and groundwater flows, and the results of age dating of groundwater in certain drinking water wells.

6. I have also reviewed more recent reports from Saint-Gobain's consultant Barr Engineering, together with another consultant, Golder Associates, concerning their speculation about other potential sources of PFOA in Bennington and North Bennington and concerning the geology of the area of the Bennington Landfill.

7. I have also reviewed a recent Declaration of Mr. Richard Spiese of the VT DEC providing updates on the activities of the state to secure a clean water supply for the residents of the Zone of Contamination with contaminated drinking water wells.

8. Based on all the information I have reviewed, including the reports of Defendant's experts, it continues to be my opinion that the zone of PFOA contamination

designated by the VT DEC as the PFOA Area of Interest reasonably represents the area where groundwater has been contaminated with PFOA from the operations of the former ChemFab/Saint-Gobain facilities on Water Street in North Bennington, and Northside Drive in Bennington. I have attached an updated map showing the updated VT DEC PFOA Area of Interest as Exhibit A to this Declaration, which I refer to as the Zone of Contamination.

Defendant's expert hydrogeologist Morrissey agrees with me that available data and information show that operations at the former Chemfab/Saint-Gobain facilities were the source of PFOA in groundwater at "certain" locations, but he does not express any opinion about the specific "certain" locations at which he believes PFOA released from the former Chemfab/Saint-Gobain facilities contaminated groundwater. Nor did Morrissey conduct any modeling or other calculations to support his opinions.

9. Based on all the information I have reviewed, including the reports of Defendant's experts, it continues to be my opinion that the Chemfab/Saint-Gobain facilities were the source of the PFOA groundwater contamination in the Bennington area that contaminated water supplies used by residents in the Zone of Contamination primarily through air releases of PFOA.

10. Contrary to the criticism of my methodology in arriving at these overarching opinions by Defendant's expert witnesses, I do not rely only upon calculations to determine the extent and source of contamination of groundwater by PFOA in Bennington and North Bennington. My calculations, as well as the air dispersion modeling of Gary Yoder, were used to scientifically test the association between the known extent of contamination and the air emissions of PFOA from the Saint-Gobain plants. The methodology proceeded in steps as follows:

- (a) The broad extent of the groundwater contamination by PFOA was well established from sampling of hundreds of drinking water wells for PFOA throughout Bennington and North Bennington and does not require either calculations or modeling to show where it occurs. The sampling and analyses were performed by consultants to Saint-Gobain at the direction of the VT DEC. The VT DEC delineated the Zone of Contamination based on these sampling results, and I agree with their delineation. (See Ex. A, attached).
- (b) The well sampling results show an obvious plume of PFOA contamination emanating from the Saint-Gobain Water Street Plant where the highest concentrations are found and then logically decreasing in concentration with increasing distance away from the plant. (See Ex. B, attached). This is a classic expression of what would be expected for a groundwater contamination plume, which I have encountered on numerous occasions in my work on groundwater contamination, which makes it easy to identify the source of the contamination.
- (c) However, based on my hydrogeological knowledge and experience and my review of the hydrogeology of the area, it is apparent that the primary means by which migration of the PFOA occurred throughout the Zone of Contamination could not have been movement of contaminated groundwater from leaks or spills at the source of contamination through the groundwater. This is because PFOA contamination in Bennington also occurs upgradient (uphill) from the source, on the other side of major hydrogeologic divides, such as the Walloomsac River, and in the opposite direction from the general direction of groundwater flow.

- (d) The only other means of migration of PFOA to form such a compelling plume pattern observed in Bennington groundwater is deposition of PFOA through the air on the soils and then moving downward through the soils to groundwater below. I am familiar with scientific literature showing air dispersion and deposition of PFOA and other pollutants which contaminated groundwater in similar plume-shaped patterns from the source. For instance, PFOA emissions from a DuPont plant in Parkersburg, WV, were carried miles downwind and deposited on soils resulting in contamination of drinking water wells on the other side of the Ohio River from the plant.
- (e) To test the efficacy of the air-to-groundwater pathway from the Saint-Gobain facilities, I first relied upon air dispersion modeling conducted by Gary Yoder of TRM which shows the likely areas of deposition of PFOA onto soils in North Bennington and Bennington, based on air emissions from the two former Chemfab/Saint-Gobain facilities. As shown in Exhibit C, attached, the pattern of deposition is consistent with and supports the conclusion that PFOA from the facilities was distributed through the air to contaminate groundwater and water wells in the Zone of Contamination in North Bennington and Bennington. The air deposition patterns shown by all air dispersion models performed by the VT DEC and by Barr Engineering, also shown in Exhibit C, show similar broad patterns of PFOA deposition consistent with the groundwater contamination. Subsequent air dispersion modeling performed by AMEC for VT DEC further supports my opinion.
- (“Bennington PFOA – Preliminary Air Deposition Modeling Technical Memorandum,” from Ryan Cleary, AMEC Foster Wheeler, to John Schmeltzer, VTDEC, May 24, 2018).

- (f) I then used a well-accepted calculation methodology, called the Rao model, to determine if observed PFOA groundwater contamination levels in groundwater generally agreed with calculated air deposition rates. My calculations support my opinion that PFOA from the Saint-Gobain facilities migrated into the groundwater in a manner consistent with the actual observed pattern of contamination in the Zone of Contamination emanating from the Water Street plant and being distributed in the predominant wind directions. The calculations support what is hydrologically obvious, since the hydrogeologic setting of the Bennington area makes it highly vulnerable to any contamination placed on its soils, be it PFOA, pesticides, or fertilizers, because that hydrogeology consists mostly of faulted, folded, and fractured bedrock exposed or near the land surface, or sand and gravel deposits on fractured bedrock.
- (g) The Rao model was designed to evaluate the vulnerability of groundwater to be contaminated from surface deposition of contaminants, based on the properties of the contaminant and those of the underlying soil and rock. PFOA, intrinsically, has properties making its contamination of groundwater very likely, because PFOA does not break down in the environment and only slightly sticks (sorbs) to soils. In performing my calculations, I used two sets of hydrogeologic properties found in a variety of locations throughout the Zone of Contamination: (1) the bedrock aquifer generally located east of the former Water Street Plant, and (2) the area southwest of the Bennington Landfill where sand and gravel aquifers occur as they do in many locations in the Walloomsac River Valley.

- (h) My calculations using the Rao model show that PFOA emission rates determined by Dr. Hopke and VT DEC (1,000 pounds per year or more) and subsequent deposition of PFOA on the soils in the area would lead to the observed concentrations of PFOA in groundwater in the Zone of Contamination and be consistent with the broad zones of contamination observed and defined by the VT DEC. This is, again, because the geologic setting of Bennington and North Bennington is highly vulnerable to contamination by any measure of vulnerability.
- (i) My calculations were not intended to “predict” groundwater PFOA contamination levels at specific wells in the Zone of Contamination, but to provide a broad test which confirmed that the source and mechanism of the widespread contamination of PFOA throughout the Zone of Contamination was the air emissions of PFOA from the Chemfab/Saint-Gobain facilities. This confirmation, plus the lack of evidence of any other credible sources of PFOA releases (see below), provides an additional level of scientific certainty to my opinion that the groundwater throughout the Zone of Contamination has been contaminated by PFOA released into the air from the Saint-Gobain facilities and deposited on the soils throughout the Zone.

11. The results of my calculations are generally applicable throughout the Zone of Contamination based on a broad range of hydrogeologic properties in soils and support my opinion that PFOA likely migrated from the surface to groundwater in less than 10 years, except where the water table is significantly deeper than average or perhaps in wetland areas where organic matter in soils can be high. I acknowledge that local differences in hydrogeologic properties from location to location within the Zone of Contamination would affect the precise amount of time it would take for surface contamination by PFOA to migrate to the groundwater

at specific locations. However, this variability does not affect my opinion that people with wells in the Zone of Contamination were likely drinking PFOA contaminated water for over two decades before the contamination was found by sampling by VT DEC in 2016. This opinion was further confirmed by the age dating of the water in certain drinking water wells by the United States Geological Survey showing that the water in some PFOA contaminated wells is 20-30 years old.

11. Providing further support to my opinion that the Chemfab/Saint-Gobain facilities are the source of the PFOA in the groundwater in the Zone of Contamination is the lack of any evidence of other sources of PFOA releases into the groundwater or air in the Bennington area other than the air releases from the Saint-Gobain facilities. Barr Engineering, along with Golder Associates, consultants to Saint-Gobain, produced a second report after my original expert report again speculating about other “potential sources” of PFOA in the groundwater. Defendant’s expert meteorologist Chinkin mischaracterized the language in the Barr/Golder report in his expert report. He claimed that the Barr/Golder report “identified” sources, while the Barr/Golder report merely listed “potential sources.” Furthermore, while the Barr/Golder report named specific properties in Bennington and North Bennington where the presumed activities may have resulted in the use and release of PFOA, many of these property owners have provided sworn declarations stating that they either do not conduct the activity identified in Defendant’s report and/or have never used PFOA on their property. These declarations are attached to my rebuttal report.

12. At my direction, my consulting firm conducted an extensive review of publicly available historic records for chemical use and release in the North Bennington/Bennington area. We employed a professional environmental database company to acquire available records of

past use and/or release of hazardous chemicals. We reviewed all available reports at known contaminated properties in the North Bennington/Bennington area and reviewed the administrative and technical records of the investigations at landfills in the area. We did not identify any other commercial, agricultural or industrial users of PFOA other than Chemfab/Saint-Gobain with the exception of one battery company in Bennington for which sampling by VT DEC showed no releases from the facility. The Vermont Agency of Natural Resources (VT ANR) conducted an internal investigation of their own files and records, particularly from the air permitting and engineering services program, and did not find any evidence or records that suggest other businesses or industries emitted PFOA in the North Bennington/Bennington area which could have resulted in contamination of groundwater.

13. Defendant's expert Morrissey disagreed with my opinion that the Bennington Landfill is not the source of the PFOA found in domestic wells to the southwest of the landfill based on his interpretation of the geology of the area and based upon a Barr Engineering report which associated another substance called perfluorooctanesulfonate (PFOS) with PFOA and claimed erroneously that Saint-Gobain never used PFOS at the Water Street Plant. When a site investigation of the Saint-Gobain Water Street Plant was performed by Barr a few months later, however, high concentrations of PFOS were found in residues in the building where the towers and stacks were located in the plant. The presence of PFOS in the groundwater along with PFOA is, therefore, consistent with air emissions from the Saint-Gobain plant, and the pattern of PFOA contamination around the landfill is consistent with air emissions of PFOA from the plant and not from the landfill. Even if the PFOA had migrated from the Bennington Landfill, Saint-Gobain is the only documented source of disposal of waste containing PFOA in the landfill. Moreover, where Saint Gobain suggests there may be other subsurface sources, I see no evidence

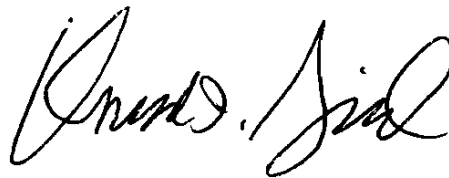
showing clear plumes of PFOA going from high concentrations at the sources to high concentrations in groundwater to lower concentrations farther away, as compared to the extraordinarily clear plume trending from Saint Gobain's Water Street plant across the Zone of Contamination.

14. In my original expert report, I performed calculations to determine the likely amount of time the PFOA groundwater contamination will persist within the Zone of Contamination due to the PFOA-contaminated soils continuing to act as a source of contamination of the groundwater. Because PFOA does not degrade in the environment, the only way the groundwater contamination will be reduced is through dilution from uncontaminated precipitation infiltrating through the soils to the groundwater, and through movement of contaminated groundwater away from the area in surface streams. I revised my calculation in the rebuttal report, which shows that the PFOA contamination will remain for at least decades. For all intents and purposes, the PFOA contamination is permanent.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

02/13/19

Date



Donald I. Siegel